1,2 butylene oxide

Preparation Date: June 10, 2024 Rev. 2 Replaces August 12, 2020

1. PRODUCT AND COMPANY IDENTIFICATION

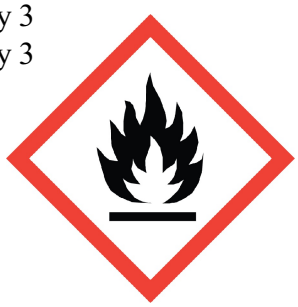
Product Name:	1,2-Butylene Oxide
Uses:	Additive for solvents as well as chemical intermediary; monomer **FOR INDUSTRIAL USE ONLY -NOT FOR CONSUMER USE OR SALE**
Synonyms:	Epoxy butane, N-butylene-1,2 oxide
Distributor:	Enviro Tech International, Inc. 1800 N 25th Avenue Melrose Park, IL 60160 www.envirotechint.com
Emergency Contact:	Velocity EHS - US, Canada, Puerto Rico, U.S. Virgin Islands (800) 255-3924 INTERNATIONAL CALLS: +01-813-248-0585 Local Emergency Contact: 708-343-6641

2. HAZARD IDENTIFICATION

Signal Word: DANGER

CLASSIFICATION

Flammable liquids	Category 2
Acute toxicity	Category 4 (Oral, Inhalation, Dermal)
Skin irritation	Category 2
Eye irritation	Category 2A
Carcinogenicity	Category 2B (IARC)
Specific target organ Toxicity - single exposure	Category 3
Aquatic Acute	Category 3
Aquatic Chronic	Category 3



HAZARD STATEMENTS

H224	Highly flammable liquid and vapor
H302	Harmful if swallowed
H313	Causes skin irritation
H319	Causes serious eye irritation
H320	Harmful if inhaled
H332	Harmful if inhaled
H335	May cause respiratory irritation
H351	Suspected of causing cancer
H402	Harmful to aquatic life
H412	Harmful to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS

P102	Keep out of reach of children
P103	Read label before use

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed
P234	Keep only in original container
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe vapor/spray
P262	Do not get in eyes, on skin, or on clothing
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use in a well-ventilated area
P273	Avoid release to the environment
P280	Wear protective gloves/eye protection/face protection
P281	Use personal protective equipment as required.
P285	In case of inadequate ventilation wear respiratory protection.
P403	Store in well-ventilated place.

RESPONSE

P308 + P314	IF EXPOSED: Get medical advice/attention if you feel concerned.
P305 + P351 + P338 + P337 + P313	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention
P302 + P361 + P353 + P352 + P363 P333 + P313	IF ON SKIN: remove immediately all contaminated clothing. Rinse skin with water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention.
P304 + P340 + P342 + P311	IF INHALED: Remove individual to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician
P301 +P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Call a POISON CENTER/doctor if you feel unwell.
P306 + P361 + P363	IF ON CLOTHING: Remove immediately all contaminated clothing. Wash contaminated clothing.

STORAGE & DISPOSAL

P403 + P235 + P404 + P233	Store in a well-ventilated place. Keep Cool. Store in a closed container.

P501	Dispose of contents/containers in accordance with all Federal, State and local rules and regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS #	Concentration
2-Butylene oxide	106-88-7	99.0 %
3-Epoxybutane	3266-23-7	0.9%

4. FIRST AID MEASURES

Inhalation	Move person to fresh air. If not breathing , give artificial respiration ; If breathing is difficult give oxygen. Call a physician or transport to a medical facility.
Skin contact	Immediately flush skin with water while removing contaminated clothing and shoes. Wash clothing before reuse. Contaminated leather items such as shoes should be disposed of properly. Suitable emergency safety shower facility should be immediately available. Seek medical attention if symptoms occur.
Eye contact	Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes.
Ingestion	If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.
Notes to physician	Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) symptoms. Bronchodilators, expectorants, antitussives and corticosteroids may be of help. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Excessive exposure may aggravate preexisting asthma and other respiratory disorders.

5. FIREFIGHTING MEASURES

Suitable extinguishing media	Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.
Unsuitable extinguishing media	Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire.
Hazardous combustion products	During a fire, smoke may contain the original material in addition to combustion products of varying composition

	which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.
Unusual Fire /Explosion Hazards	Container may vent and/or rupture due to fire. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature. Flammable concentrations of vapor can accumulate at temperatures above flash point; See Section 9.
Fire Fighting Procedures	Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water may not be effective in extinguishing fire. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Do not use direct water stream. May spread fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Avoid accumulation of water. Product may be carried across water surface spreading fire or contacting an ignition source.
Protective Equipment	Wear positive-pressure self-contained breathing for firefighters: apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Keep personnel out of low areas. Keep personnel out of confined or poorly ventilated areas. Keep upwind of spill.
Emergency Procedures	Evacuate area. Ventilate area of leak or spill. No smoking in area. Confined space entry procedures must be followed before entering the area. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers.
Environmental Precautions	Material may float on water and any runoff may create an explosion or fire hazard if ignited. Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.

Methods/Materials for Containment	Do not use absorbents and avoid contact with absorbent materials such as clay-based absorbents. Collect in suitable and properly labeled containers. Dike area to contain spill. Apply vapor suppression foams until spill can be cleaned up. For large spills, warn public of downwind explosion hazard. Dilute with large quantities of water. Wash water should be disposed of in accordance with local regulations. Ground and bond all containers and handling equipment. Pump with explosion-proof equipment. If available, use foam to smother or suppress.

7. HANDLING AND STORAGE

Safe Handling	Avoid contact with eyes, skin, and clothing. Do not swallow. Avoid breathing vapor or mist. Use only with adequate ventilation. Keep container closed. Wash thoroughly after handling. Never use air pressure for transferring product. No smoking, open flames or sources of ignition in handling and storage area. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Keep away from heat, sparks and flame. Do not enter confined spaces unless adequately ventilated. This product is a poor conductor of electricity and can become electrostatically charged, even in bonded or grounded equipment. If sufficient charge is accumulated, ignition of flammable mixtures can occur. Handling operations that can promote accumulation of static charges include but are not limited to mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.
Storage	Flammable mixtures may exist within the vapor space of containers at room temperature. Minimize sources of ignition, such as static build-up, heat, spark or flame. Do not store in: Opened or unlabeled containers. Store in the following material(s): Carbon steel. Stainless steel. Keep container closed. Store in a dry place. Protect from atmospheric moisture. Do not store mixtures of this product and water to avoid potential for hazardous reaction.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls	Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only in enclosed systems or with local exhaust ventilation. Exhaust systems must be explosion proof. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. Lethal concentrations may exist in areas with poor ventilation.
Eye/face protection	Use tightly fitting chemical goggles. If exposure causes eye discomfort, use a full- face respirator.
Hand protection	Use gloves chemically resistant to this material. 0.7 mm coating thickness
Other protection	Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.
Respiratory protection	Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Liquid
Color	Clear
Flammability (solid, gas)	N/A
Flash point	-22° C (-8° F) ASTM D56
Lower explosion limit	9.5% at 25° C (77° F) Literature
Upper explosion limit	19 % vol Literature
Odor	Characteristic
Odor Threshold	No data available
Vapor Pressure	176 mmHg at 25° C (77° F) Literature
Vapor Density (air = 1)	2.2 Literature
pH	No data available
Relative Density (water = 1)	0.826 at 25° C (77° F) / 25° C Literature
Water solubility	No data available
Boiling point (760 mmHg)	63.4° C (146.1° F) Literature
Partition Coefficient: n-octanol/water	log Pow: 0.68 Measured
Evaporation Rate	No data available
Decomposition Temperature	No data available

Kinematic Viscosity	0.48 mm2/s at 25° C (77° F) Estimated
Auto-ignition Temperature	439° C (822° F) Literature
Molecular Weight	72.1 g/mol Literature

10. STABILITY AND REACTIVITY

Reactivity	No data available
Chemical Stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Elevated temperatures can cause hazardous polymerization. Polymerization can be catalyzed by: Acidic pH. Water. Acids. Alkali metal hydroxides. Anhydrous metal chlorides (aluminum/iron/tin etc.). Bases. Basic pH. Salts.
Conditions to avoid	Exposure to elevated temperatures can cause product to decompose. Avoid two phase storage with water, a slow exothermic reaction may be initiated. Avoid humidity. Avid all sources of ignition: heat, sparks. open flame.
Incompatible materials	Avoid contact with oxidizing materials. Avoid contact with: Acids. Bases. Water. Avoid contact with absorbent materials such as clay-based absorbents.
Hazardous decomposition products	Decomposition products depend upon temperature, air supply and the presence of other materials.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	LD_{50} - Rat 900 mg/kg
Acute dermal toxicity	Prolonged or widespread skin contact may result in absorption of potentially harmful amounts. LD_{50} - Rabbit > 1,500 -< 2,950 mg/kg
Acute inhalation toxicity	LC_{50} - Rat, male and female, 4 Hr, vapor - > 6.3mg/l No deaths occurred at this concentration. In confined or poorly ventilated areas, vapor can readily accumulate and can cause unconsciousness and death. Prolonged excessive exposure may cause serious adverse effects, even death. Vapor may cause severe irritation of the upper respiratory tract (nose and throat) and lungs. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed.
Skin corrosion/irritation	Prolonged contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage. Repeated contact may cause severe skin burns. Symptoms may include pain, severe local redness and tissue damage. May cause more severe response if skin is abraded (scratched or cut). May cause more severe response on covered skin (under clothing, gloves).

Eyes	Serious eye damage/eye irritation. May cause moderate eye irritation. May cause slight corneal injury. Vapor may cause eye irritation experienced as mild discomfort and redness.
Specific Target Organ Systemic Toxicity (Single Exposure)	May cause respiratory irritation.
Route of Exposure	Inhalation
Target Organs	Respiratory Tract
Specific Target Organ Systemic Toxicity (Repeated Exposure)	In animals, effects have been reported on the following organs: Peripheral nervous system. Respiratory tract.
Carcinogenicity	IARC Group 2B: Possibly carcinogenic to humans
Teratogenicity	Did not cause birth defects or any other fetal effects in laboratory animals.
Reproductive toxicity	Limited data in laboratory animals suggest that the material does not affect reproduction.
Mutagenicity	In vitro genetic toxicity studies were positive. Animal genetic toxicity studies were negative.

12. ECOLOGICAL INFORMATION

Acute toxicity to fish	Material is slightly toxic to aquatic organisms on an acute basis (LC_{50}/EC_{50} between 10 and 100 mg/L in the most sensitive species tested). LC_{50}, Leuciscus idus (Golden orfe), static test, 96 Hour, > 100 mg/l, DIN 38412
Acute toxicity to aquatic invertebrates	EC_{50}, Daphnia magna (Water flea), static test, 48 Hour, 70 mg/l, OECD Test Guideline 202 or Equivalent
Acute toxicity to algae/aquatic plants	ErC_{50}, Desmodesmus subspicatus (green algae), 72 Hour, Growth rate inhibition, > 500 mg/l Toxicity to bacteria EC50, activated sludge, static test, 0.5 Hour, Respiration rates., 900 mg/l, activated sludge test (OECD 209)
Biodegradability	Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. 10-day Window: Pass. Biodegradation: 90 %. Exposure time: 28 d. Method: OECD Test Guideline 310 or Equivalent. Theoretical Oxygen Demand: 2.44 mg/mg
Stability in Water (1/2-life)	Hydrolysis, half-life, 11 days
Photodegradation	Test Type: Half-life (indirect photolysis)
Sensitization OH radicals	Atmospheric half-life: 6 days Estimated.
Bioaccumulative potential	Bioaccumulation: Does not accumulate in organisms. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient	n-octanol/water(log Pow): 0.68 at 25 °C Measured
Mobility in soil	Potential for mobility in soil is very high (Koc between 0 and 50). Partition coefficient (Koc): 4.49 Estimated.

13. DISPOSAL CONSIDERATIONS

Do not dump into any body of water, sewers or on the ground. Dispose in compliance with all Federal, State and local laws and regulations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. Since empty containers retain product residue, follow label warnings, even after container is emptied. Send unused & uncontaminated product to licensed waste facility for incineration.

14. TRANSPORT INFORMATION

US DOT	Proper Shipping Name: 1,2-butylene Oxide, Stabilized UN 3022 Class 3 Packing Group 2
IMDG	Proper Shipping Name: 1,2-butylene Oxide, Stabilized UN 3022 Class 3 Packing Group 2

15. REGULATORY INFORMATION

USMCA	Complies
TCSA	All components in the TSCA inventory and active.
CERCLA	Reportable Quantity - 100 lbs.
RCRA	N/A
HAP	N/A
VOC	No data available
GWP	No data available
SARA 313	Subject to reporting < 0.6 % by weight
SARA 311/312	Acute Health Hazard: Yes Chronic Health Hazard: Yes Fire Hazard: Yes Sudden Release of Pressure Hazard: No Reactive Hazard: No
Right to Know	Massachusetts, New Jersey, Pennsylvania, Rhode Island, Minnesota. California Air Toxics Hit Spots A-1 - Present.

16. OTHER INFORMATION

Only trained personnel should use this material. Each user of this product should study this SDS carefully and consult appropriate expertise as necessary to become aware of and understand the data contained in this SDS and any hazards that may be associated with this product. The information provided in this Safety Data Sheet relates only to the specific material designated herein. The user is responsible for determining the conditions of safe use of this product and for complying with all Federal, State and Local governmental laws and regulations concerningits use. Enviro Tech International, Inc. makes no warranty, express or implied, including the warranty of merchantability and fitness for a particular purpose, and assumes no liability or responsibility for the accuracy, completeness, timeliness or usefulness of this information. Enviro Tech International, Inc. assumes no liability for any damages incurred, whether directly or indirectly, as a result of any errors, omissions or discrepancies in this information. Enviro Tech International, Inc. assumes no liability for reliance on this data and assumes no liability for damages related to the use or misuse of this product.

Preparation Date: June 10, 2024 Rev. 2 Replaces August 12, 2020